

Globalisation issues and consumers' purchase decisions for food products: evidence from a laboratory experiment

Anne-Célia Disdier^{†*} and Stéphan Marette[‡]

[†]Paris School of Economics-INRA, France; [‡]UMR Economie Publique INRA-AgroParisTech, France

Received January 2011; final version accepted October 2011

Review coordinated by Paolo Sckokai

Abstract

A laboratory experiment is conducted to evaluate the impact of globalisation on consumers' willingness to pay (WTP) for food products. Successive messages on the products' origin and the multinational firm's strategy are delivered to participants. Interestingly, the significant decrease in WTP resulting from negative messages about foreign sourcing and the closure of processing facilities is reversed after the revelation of positive information linked to the multinational firm's new products/services and investments made in the domestic country. The experiment also studies the effects of two labels (geographic indication and fair trade). The introduction of labels increases the consumer surplus.

Keywords: experimental economics, globalisation, labels

JEL classification: C91, F15, Q18

1. Introduction

Globalisation is often presented by governments/international organisations as a catalyst for the integration of developing countries into the world economy, since it may enhance developing countries' production and export capacities. However, an increasing number of citizens in developed countries fear economic competition from developing countries and do not view globalisation as an opportunity for economic growth in their own country. For example, 43 per cent of respondents to the Eurobarometer public opinion surveys published by the European Commission in autumn 2008 believe that globalisation represents a threat to employment and companies in the European Union (European Commission, 2008). Additionally, this negative feeling combined

*Corresponding author: Paris School of Economics-INRA, 48 boulevard Jourdan, 75014 Paris, France. E-mail: anne-celia.disdier@ens.fr

with the 2008 financial crisis has led to fears of new protectionist policies (van Bergeijk, 2010).

In several European countries, such as France, questions about globalisation are particularly sensitive. The replacement of domestic sourcing by foreign sourcing, especially from developing countries, is generally a thorny issue in public debates. In the aftermath of the 2008 financial crisis, intellectual assaults on free trade and globalisation intensified. One striking example provided by Todd (2008) suggests that only European protectionism can preserve Europe's industries and social stability (Thornhill, 2008).

However, this anti-globalisation sentiment is not clearly demonstrated when consumers' decisions are observed: 44 per cent of European citizens say that they personally benefit from international trade, as it provides wider choice and cheaper products (European Commission, 2010).

Our paper sheds light on questions linked to globalisation and consumers' valuation. In particular, we try to investigate the following questions: Do consumers pay attention to the origin of products because of concerns about globalisation? Does globalisation affect the purchase decisions of consumers in developed countries and, more particularly, their purchase of goods produced in developing countries? Our paper addresses these questions using the results of a laboratory experiment conducted in France in 2010.

Our experiment evaluates the impact of information linked to globalisation on consumers' willingness to pay (WTP) for pickles. Food is particularly well suited to laboratory experiments (Lusk and Shogren, 2007). The main advantage of pickles is that they are a simple food product and their origin is easy to identify, which is not the case for manufactured products such as aircraft or cars made with many components from around the world. Furthermore, Maille, the main French producer of pickles, was taken over by Unilever in 2000 and their pickle-growing operation, initially located in France, was moved to India and Madagascar in 2004, leading to savings of 30–40 per cent on the cost of pickles. Our experiment is able to measure the impact of these recent changes on consumers' WTP for that good.

We use the BDM procedure (defined by Becker, DeGroot and Marschak, 1964) to elicit WTP for pickles. Participants in the experiment are asked to indicate the maximum price they are willing to pay for the good. The BDM procedure is incentive-compatible because, at the end of the experiment, participants buy the product if their WTP is higher than a randomly selected price of exchange. Successive messages revealing recent changes in the strategy applied by Maille/Unilever are delivered to the participants. These messages relate not only to the new foreign sourcing of pickles and the closure of French processing facilities ('negative' information), but also to the development of new products and services and the firm's new investments in France ('positive' information).

The results show a statistically significant impact of messages on consumer WTP. Participants appear to be more receptive to 'negative' rather

than 'positive' information. Interestingly, when negative information is first revealed to participants, the decrease in WTP due to 'negative' messages about foreign sourcing and the closure of processing facilities is reversible with positive information about innovative products/services and new investments made by the multinational in the domestic country. This result indicates that globalisation is more acceptable to consumers than suggested by classical opinion surveys showing reluctance and concern about globalisation across the European population. In other words, people are much more supportive of globalisation when they are consumers rather than citizens.

This reversible change in WTP differs from previous experimental papers that focused on the health/safety characteristics of a product (Hayes *et al.*, 1995; Fox, Hayes and Shogren, 2002; Marette *et al.*, 2008). In these papers, if messages about health risks precede messages about health benefits, then the decrease in WTP is not reversed by subsequent information on health benefits. This suggests that people have major concerns when health or safety risks are at stake. Conversely, the present paper suggests that sensitivities exist among consumers about foreign supply replacing domestic supply, but they are not a major concern that makes participants permanently deaf to positive arguments.

This experiment also studies the effect of two labels based on the origin of the product: a fair trade label for a product produced in developing countries or a geographical indication (GI) label for a product produced in developed countries. We estimate the potential choice of each participant by estimating consumer surpluses. We show that the introduction of each label increases the average consumer surplus, as the participants initially purchasing the conventional product are the ones who place a relatively high premium on labelled products. However, such labels do not attract new consumers and do not extend the scope of the pickle market. In other words, labels only attract participants who previously purchased conventional pickles without the existence of these labels.

With this paper, we present what we believe to be the first laboratory experiment focusing on consumer responses to globalisation and foreign supply when foreign origins fully replace domestic ones (for all pickles sold in French supermarkets). This differs from previous experiments capturing the additional WTP linked to the local characteristics of the product when a wide range of competing products with various origins are available in the market. Loureiro and McCluskey (2000), Scarpa, Philippidis and Spalatro (2005), Hassan and Monier-Dilhan (2006) and Toler *et al.* (2009) show preferences by some consumers for geographic indications or local food in a context where every new label increases product diversity.

The paper is organised as follows: Section 2 focuses on the experimental design; Section 3 presents the results; Section 4 discusses the implications of food labelling policies; and Section 5 concludes.

2. The experiment

2.1. Sample

We conducted the experiment in Paris, France, in multiple sessions in May 2010. We selected the participants using the quota method. This method uses the same proportions of age and socio-economic status criteria in the sample as in the general French population. Participants were first contacted by phone and informed that they would have to reply to questions about food for one hour with a participation fee of EUR 20. We made it clear that a portion of this money could potentially be used to purchase a jar of pickles based on a mechanism explained to participants (see below).

The initial sample consisted of 102 participants. The analysis is made with 'engaged' participants, those expressing at least one WTP greater than zero (Lusk and Fox, 2003). The 10 'non-interested' bidders, defined as unengaged bidders, are eliminated from the sample.¹ Therefore, the sample used for the analysis consists of 92 participants between the ages of 21 and 72. All subsequent tables present the results linked to these 92 participants.² During the experiment, we divide our sample into two groups (groups I and II) and randomly assign participants to one group. The two groups receive the same information but in a different order.

Table 1 presents the socio-economic characteristics of the 92 participants within each group and the frequency of their pickle consumption. Differences between the two groups are tested using the Pearson χ^2 test. A p -value (against the null hypothesis of no differences) of less than 5 per cent is considered significant.³ Results suggest that the two groups are not significantly different except for gender.

2.2. Product

Our experiment focuses on pickles for four main reasons. First, unlike many manufactured products, food products are well suited to laboratory experiments (Lusk and Shogren, 2007). Second, food products are often very simple, and their origin (in terms of production) can be easily traced; this is clearly the case for pickles. Third, pickles are consumed by consumers without transformation and are a classic condiment in many countries. In France, pickles have been consumed since the sixteenth century, and current consumption stands at 25,000 tons (net drained) per year (i.e. 400 g per inhabitant). Lastly, some globalisation issues are linked to their production and sales, especially in France.

1 Given the EUR 20 indemnity, the unengaged bidders are likely to be non-interested by the product rather than being cash constrained.

2 Results for the 102 participants can be provided upon request.

3 This 5 per cent level of significance is used as the decision point to reject the null hypothesis throughout the paper.

Table 1. Socio-economic characteristics of participants and pickle consumption

Description	Group I (%)	Group II (%)	χ^2 test (<i>p</i> -value)
Gender			
Male	57.5	31.1	0.011
Female	42.5	68.9	
Age			
≤25	21.3	8.9	0.182
26–54	53.2	53.3	
≥55	25.5	37.8	
Education			
No baccalaureate (BAC)	10.6	11.4	0.746
BAC or 2 years after BAC	29.8	22.7	
More than 2 years after BAC	59.6	65.9	
Monthly net income of the household (EUR)			
≤1,500	21.7	17.8	0.684
1,501–3,999	60.9	57.8	
≥4,000	17.4	24.4	
Children at home			
No	76.6	60.0	0.087
Yes	23.4	40.0	
Pickle consumption			
Never or rarely	30.4	30.4	0.425
One to three times per month	32.6	43.2	
At least once a week	37.0	25.0	
Pickles and health			
Pickles are healthy	66.0	75.6	0.494
Pickles are not healthy	8.5	8.9	
Neutral	25.5	15.5	

Note: For each characteristic, missing observations and answers 'do not know' are dropped from the sample. Baccalaureate is the French high school diploma.

For the experiment, we selected a pickle jar of 380 g (net drained): the Maille 'Cornichons' brand. French consumers usually view Maille as a traditional, high-quality brand. In our experiment, 86 per cent of participants held Maille in this regard. The company also uses this perception in its advertising. For example, on its website, the brand presents itself as follows: '250 years after it was founded, the company remains loyal to and continues to cultivate its original values of high standards, excellence and refinement.'⁴ The jar's packaging clearly indicates that the pickles are hand-picked. However, the origin of these pickles was not mentioned at the time of the experiment or at the time that the present paper was written. As previously mentioned, Maille was taken over by the Anglo-Dutch group Unilever in 2000 and the Indian and Malagasy replaced the French supply of pickles in 2004.⁵

4 http://www.maille.ca/pages/history_excellence.aspx.

5 This change was decided for cost reasons. The cost of Indian/Malagasy pickles is 30–40 per cent

2.3. Experimental design and information revealed

Our experiment uses the BDM procedure to elicit participants' WTP (Becker, DeGroot and Marschak, 1964). With this procedure, participants are asked to indicate the maximum price they are willing to pay for a jar of pickles. Successive items of information are revealed to participants, and WTP is elicited after each message. The exact question is as follows: 'What is the maximum price you are willing to pay for the pickle jar?' We conduct the experiment in two treatments, varying the order of information provided to participants. To do so, we divide the sample into two groups (groups I and II) and randomly assign participants to one group.

The experiment is divided into several stages as described in Figure 1. The timing of the experiment is as follows.

- (i) The session starts with a trial round to explain the choice mechanisms. Simulations help participants understand the mechanisms. The possibility of zero bids in the BDM procedure is carefully explained, as well as the EUR 20 compensation for making the purchase.
- (ii) Participants fill in an entry questionnaire on consumption behaviour and socio-demographic characteristics.
- (iii) Based on the different types of information revealed to the participants, five rounds of WTP elicitation with the BDM procedure are successively determined. The observed retail price of one Maille pickle jar (EUR 3.4) is only revealed before the first WTP elicitation, which allows us to control the anchorage effect for the first round. We do not post any prices between rounds in order to avoid any confusion regarding the effects linked to price information and the effects linked to information on globalisation issues.⁶ The messages before WTP elicitations combine information about the foreign sourcing of pickles/closure of processing facilities in France and new products/new investments in France made by Unilever, owner of the brand Maille (see Appendix). These messages are based on press releases and reports produced by Maille/Unilever. The messages are simple, but also as close as possible to reality, because some participants may have prior knowledge of Maille/Unilever's strategy and recent decisions. At the time of the experiment, Maille/Unilever had already closed processing facilities in France and sourced pickles from abroad, and new investments were announced but not made. Consequently, information on foreign sourcing and the closure of processing facilities in France refers to events that have actually occurred, whereas messages about new products and new investments report the firm's intentions. The sequence of the revelation of information differs

lower than the cost of French pickles (transport and packaging included) (Delorme and Selles, 2006).

6 The issue of provision of reference prices prior to the auctions is discussed in the literature, as it could influence participants' bids. Using a second price Vickrey auction, Drichoutis, Lazaridis and Nayga (2008) show that this provision increases bid values.

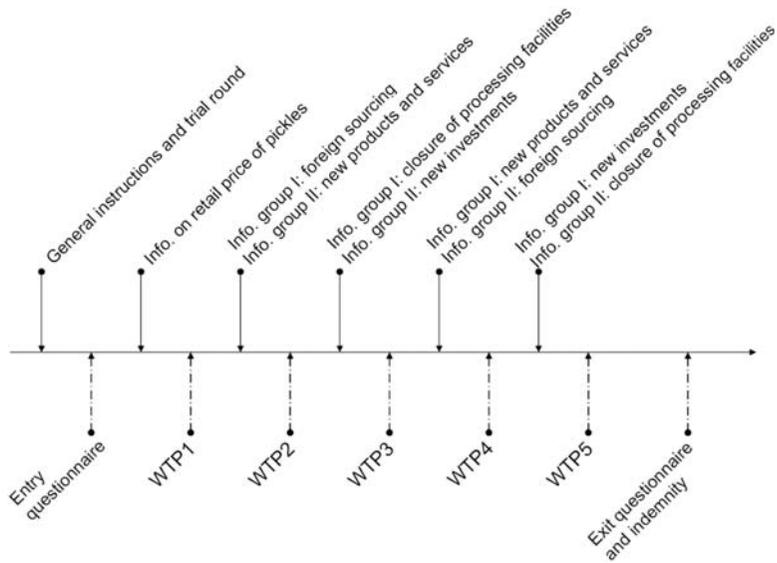


Fig. 1. Experiment design.

- between the two groups. Group I first receives the messages about foreign sourcing/closure of processing facilities, whereas group II first receives the messages about new products/new investments.
- (iv) Participants fill in an exit questionnaire on trade and globalisation issues. The experiment concludes by randomly selecting one of the five rounds of bidding, which is used to determine whether the participants take the products away with them. A price of between EUR 0.1 and EUR 5 is also drawn at random⁷ and purchase choices are enforced. If the selected WTP is smaller than the randomly drawn price, the participant receives the EUR 20 indemnity. If the WTP is higher, the compensation is equal to EUR 20 less the price randomly drawn and the participant gets the pickle jar.

The information revealed during the experiment was new for a very large proportion of participants. Some questions asked during the experiment assessed participants' prior knowledge of the relationship between Maille and Unilever. Only 19.6 per cent of participants had already heard about the Maille takeover by Unilever. Additionally, 20 per cent of participants had already heard/seen the development of new products/services by

⁷ No information is revealed to participants about the distribution of this randomly generated number acting as a market price. This absence of revelation about the distribution avoids the anchoring effect on WTP, as Bohm, Linden and Sonnergard (1997) show that results are sensitive to the choice of the upper bound of the generated buyout prices.

Maille. Lastly, only 4.3 per cent knew about the foreign origin of Maille pickles.

3. Results

3.1. Descriptive analysis

Figure 2 shows the average WTP in euros for one pickle jar expressed by engaged bidders after each round of information. The standard deviation is reported in parentheses. The x-axis details under each bar contain the information preceding the choice leading to the WTP elicitation. Figure 2 also reports the results of two non-parametric tests. The Wilcoxon test for paired-samples investigates the significance of the WTP differences linked to the revelation of a message before the round $j + 1$ (that is, between WTP_j and WTP_{j+1} for each group), while the Mann–Whitney U test examines whether the WTP values expressed at round j are significantly different between the two groups. A p -value (against the null hypothesis of no differences) of less than 5 per cent

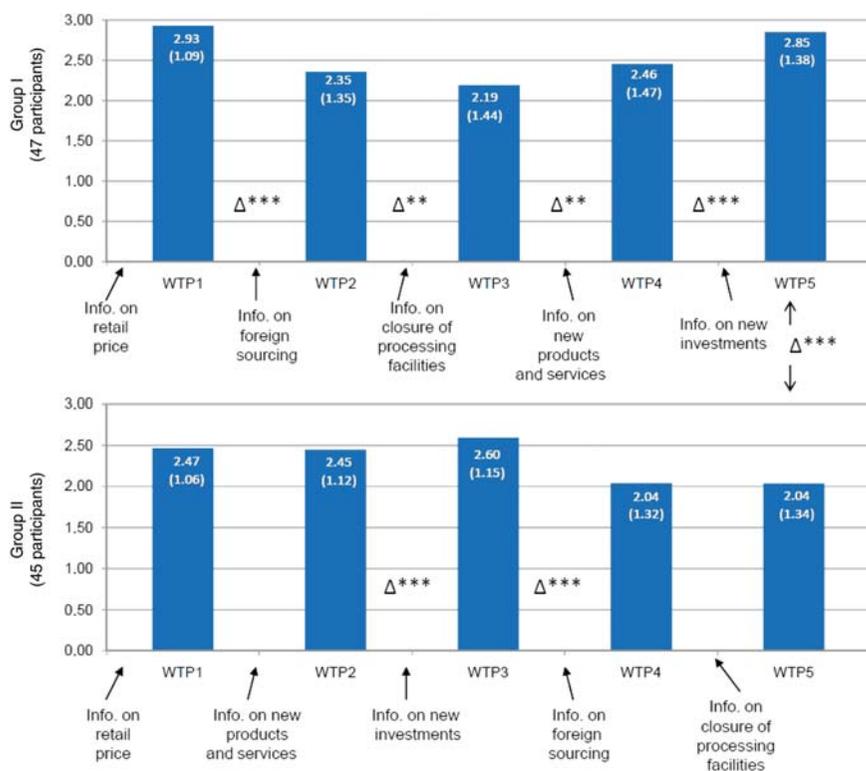


Fig. 2. Average WTP and changes after information revelation (EUR).

Note: Standard deviation in parentheses; Δ*** and Δ** denote significant differences at the 1 and 5 per cent level as tested by the Wilcoxon and the Mann–Whitney U tests.

is considered significant. The indicators Δ^{***} and Δ^{**} show the significance at 1 and 5 per cent levels, respectively. The first bar of each graph reveals WTP1, namely the WTP after the revelation of simple information about the retail price of a pickle jar. The Mann–Whitney U test suggests that the WTP1 values expressed by the participants of the two groups are not significantly different at the 5 per cent level.

Results of the Wilcoxon test show that information matters. For group I, the decrease in WTP due to both 'negative' messages about foreign sourcing of pickles and the closure of processing facilities in France (with WTP3 significantly lower than WTP1) is reversed by the 'positive' messages about new products/services and new investments (WTP5 significantly higher than WTP3).⁸ Furthermore, for group I, WTP5 is not statistically different from WTP1 (Z -value = -0.233 , p -value = 0.816 with the Wilcoxon test), which confirms the reversibility of the WTP decrease linked to negative information by subsequent positive information. This result suggests that characteristics linked to trade matter to some consumers, but this is not as major a concern as health/safety characteristics, for which risky/tainted products lead to zero bids (or low bids) even after the subsequent revelation of positive information (Hayes *et al.*, 1995; Fox *et al.*, 2002; Marette *et al.*, 2008). These differences in terms of the reversibility of WTP decrease following the revelation of negative economic and health information can be explained as follows: negative health effects linked to the consumption of toxic products are difficult to counterbalance with the consumption of healthy products. Thus, negative health impacts are often irremediable. In contrast, negative economic impacts are more often reversible. Job destruction, for example, may be compensated by job creation. The overall effect may be close to zero (at least for people who do not lose their jobs and/or people who lose their jobs, but find new ones).

There is no evidence of boycotts by consumers when firms compensate for the delocalisation of sourcing by additional social benefits (like new products/new investments). In group I, only five participants with positive WTP1 subsequently select a WTP2 bid equal to zero after the revelation of information on the new foreign source of pickle growing. Among them, only two participants maintain their final bid with $WTP5 = WTP2 = 0$, whereas the three other participants show WTP5 close or equal to WTP1 after the complete revelation of information (including the positive messages).

A similar trend is observed for group II (with WTP3 significantly higher than WTP1, and WTP5 significantly lower than WTP3). The impact of information on foreign sourcing with $E(WTP4) - E(WTP3) = -0.56$ is similar to that of group I with $E(WTP2) - E(WTP1) = -0.58$. Except for the information on foreign sourcing, participants seem to be less sensitive to the information revelation than group I (WTP2 is not statistically different from WTP1,

⁸ We label information on foreign sourcing and the closure of processing facilities in France as 'negative' information and information on new products/services and new investments made in France as 'positive' information.

and WTP5 is not statistically different from WTP4). Moreover, the ‘positive’ information revealed initially leads to a lower WTP shift, with $E(\text{WTP3}) - E(\text{WTP1}) = 0.13$ compared with the WTP shift in absolute value due to the negative information with absolute value $E(\text{WTP5}) - E(\text{WTP3}) = 0.56$. Therefore, for this group, negative information appears to have a more powerful impact than positive information. This result is similar to that reported in other studies (see, for example, Tegene *et al.*, 2003). This result differs from group I, for which the positive information counterbalances the negative information initially revealed. For group II, WTP5 remains significantly different from WTP1 (Z -value = -4.159 , p -value = 0.000 with the Wilcoxon test). The attention given to the positive information therefore seems contingent on the negative information previously revealed.

The results of the Wilcoxon test for the paired sample presented in Figure 2 are robust when unengaged participants are taken into account. This means that marginal impacts of information are invariant to the presence or absence of unengaged bidders, who do not change their WTP equal to zero during the five rounds of choices.

In addition to information effect *per se*, our analysis also suggests that the order of information revelation influences significantly participants’ WTP. The Mann–Whitney U test indicates that the WTP5 values expressed by the two groups at the end of the experiment are significantly different at the 1 per cent level, while the difference was not significant at the 5 per cent level in the previous rounds. This result is represented with both vertical arrow and indicator Δ between both charts for WTP5. As the order of information differently impacts both groups and as WTP5 is not statistically different from WTP1 for group I but statistically different for group II (see above), WTP5 differs across both groups at the end of the experiment.

Finally, the WTP expressed in the first round by participants considering Maille as a traditional and high-quality brand (86 per cent of our sample) is not significantly different from that expressed by the rest of the participants (2.69 versus 2.70). This result is also observed if group I and group II are considered separately. However, participants who had already heard about the Maille takeover by Unilever (19.6 per cent of participants) express a smaller initial WTP than non-informed participants (EUR 2.46 versus EUR 2.76). Furthermore, these informed participants react less strongly after learning about the ‘takeover’ information. This result particularly holds true for group I. The average variation in absolute value between the first and second bids equals EUR 0.25 for informed participants and EUR 0.62 for non-informed participants.

3.2. Econometric estimations

In this section, we provide more explanations regarding the results of Figure 2 and investigate the determinants of WTP. To do so, we regress the difference in WTP expressed by participants between choices $j + 1$ and j (with $j = 1, \dots, 5$)

Table 2. Influence of information on WTP (tobit random effects specification)

	Model 1	Model 2	Model 3
'Negative' information (0/1)	-0.33*** (0.05)		
'Positive' information (0/1)	0.20*** (0.05)		
'Negative' information received in the second and third rounds (0/1)		-0.37*** (0.07)	
'Negative' information received in the fourth and fifth rounds (0/1)		-0.28*** (0.07)	
'Positive' information received in the second and third rounds (0/1)		0.07 (0.07)	
'Positive' information received in the fourth and fifth rounds (0/1)		0.33*** (0.07)	
'Negative' information received in the second round (0/1)			-0.58*** (0.10)
'Negative' information received in the third round (0/1)			-0.17 (0.10)
'Negative' information received in the fourth round (0/1)			-0.56*** (0.10)
'Negative' information received in the fifth round (0/1)			-0.01 (0.10)
'Positive' information received in the second round (0/1)			-0.01 (0.10)
'Positive' information received in the third round (0/1)			0.14 (0.10)
'Positive' information received in the fourth round (0/1)			0.27*** (0.10)
'Positive' information received in the fifth round (0/1)			0.40*** (0.10)
Observations	368	368	368
Log-likelihood	-385.68	-381.69	-368.43

Note: Dependent variable: difference in WTP between choices $j+1$ and j expressed by participant i ($WTP_{j+1,i} - WTP_{j,i}$).

***Significant at 1 per cent; standard errors in parentheses.

on information. The results are presented in Table 2. Given that each participant makes multiple choices, there should be some correlation across data points relating to WTP. Furthermore, in our sample, WTP may not be negative and is left-censored at zero. In addition, the first message signals the observed

retail price of one Maille pickle jar (EUR 3.4) to participants. As suggested by Harrison, Harstad and Rutström (2004), no participant would rationally bid higher than this retail price if the product being valued is considered a perfect substitute. Therefore, WTP is likely also censored at the upper bound of 3.4. To deal with these issues, we use the random effects tobit estimator.⁹

We first examine whether the revelation of ‘negative’ information (or ‘positive’) before choice $j + 1$ decreases (or increases) participants’ WTP (column 1). We assume that three types of information are revealed during the experiment: (i) neutral information on the retail price of a pickle jar (before the first round), (ii) ‘negative’ information on production activity (before the second and third rounds for group I and before the fourth and fifth rounds for group II), and (iii) ‘positive’ information on new products/services and new investments (before the fourth and fifth rounds for group I and before the second and third rounds for group II). To test the impact of ‘negative’ and ‘positive’ information on participants’ WTP, we therefore define two dummies: one for ‘negative’ information and one for ‘positive’ information. The first dummy (or the second one) is set to 1 if ‘negative’ information (or ‘positive’ information) is revealed and 0 otherwise. Estimated coefficients on both dummy variables have the expected sign and are significant at the 1 per cent level, revealing that ‘negative’ information decreases participants’ WTP, whereas ‘positive’ information increases it.

Columns (2) and (3) investigate whether the order in which information is presented influences the WTP. In column (2), we first examine whether ‘negative’ information has a similar or different effect depending on whether it is presented first or after ‘positive’ information. We also run the test for ‘positive’ information. To perform the analysis, we define four dummies (two for ‘negative’ information and two for ‘positive’ information). The first dummy for ‘negative’ information is set to 1 if messages provided in the second and third rounds (see Figure 1) deal with foreign sourcing and closure of processing facilities (i.e. messages provided to group I). Otherwise, the dummy is set to 0. The second dummy for ‘negative’ information equals 1 if the messages on foreign sourcing and closure of processing facilities are provided in the fourth and fifth rounds (i.e. messages provided to group II). The same approach is used to define the two dummies for ‘positive’ information. The results show that ‘negative’ information always has a negative and significant impact on WTP ($p < 0.01$), regardless of whether it is presented first or after ‘positive’ information. In contrast, ‘positive’ information significantly influences WTP only if it is presented after ‘negative’ information.

9 We tested for the influence of participants’ socio-economic characteristics and their initial perception about pickles’ healthiness on WTP. Because none of the estimated coefficients on these variables was statistically significant, we decided to remove them from the estimations. This absence of significance suggests that reactions to information seem similar across the sample of participants and, by extrapolation, for the overall French population. In other words, reactions are relatively similar whoever the people participating in the experiment.

Column (3) goes one step further and separately considers the two rounds of bids where 'negative' (or 'positive') information is provided to participants. The dummies used in column (2) are divided into two, and the influence of each round of information is independently investigated. The results suggest some differences between how the participants perceive 'negative' and 'positive' information. However, they confirm the descriptive statistics reported in Figure 2. The participants of group I are significantly influenced by each round of information, whatever the type of information ('negative' or 'positive') and its order (first or second message). The estimated coefficients have the expected sign and three of them are significant at the 1 per cent level. Econometric results confirm that, for group I, the positive information counterbalances the negative information that was initially revealed. According to column (3), participants of group II are not influenced by positive information (estimated coefficients on the two dummies 'positive information received in the second round' and 'positive information received in the third round' are not significant). They are significantly influenced by the first negative message (-0.56 , $p < 0.01$), but not by the second one (-0.01 , not significant). The slight difference between Figure 2 and Table 2 for group II regarding the significance of the variation between WTP2 and WTP3 may be explained by the inclusion of individual effects in the econometric estimations. Lastly, column (3) suggests that participants are not tired of additional information. Indeed, for group I, the second round of positive information has an effect on WTP similar to the first round; the estimated coefficient observed for the second round (0.40 , $p < 0.01$) is not significantly different from the one observed for the first round (0.27 , $p < 0.01$).

4. Fair trade label or GI label

Previous results show that consumers are interested in issues surrounding globalisation and the origin of food products. This raises the question of 'fair' competition when production conditions differ greatly between countries. One regulatory possibility consists in developing labels that provide information about the conditions of production. This will allow for a diversity of products for consumers. For consumers who are sensitive to where the product is produced, a label is a possible way to restore fairness among heterogeneous countries without any risks of protectionism, since foreign products can still enter the domestic market.

In this section, we investigate the relevance of a labelling policy based on the origin and production practices of the product. We distinguish between two labels: one signalling fair trade practices for products grown in developing countries and one signalling a GI for products grown in developed countries. The development of such labels is compatible with the World Trade Organization (WTO) rules. In March 2005, the WTO released the panel report on the European GI system. The panel's conclusions and recommendations led the European Union to revise its rules governing how international GIs are treated. Specifically, the European Council (EC) Regulation 2081/

92 was amended with EC Regulation 510/2006 (WTO, 2005; EC, 2006). The amendment complied with the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the WTO, and the European Union regulation is now WTO-proof (WTO, 2006). The WTO panel decision demonstrated that the European Union's efforts to differentiate and label quality in agricultural products and foodstuffs are compatible with the WTO rules.

4.1. Economic value of labels and consumer surplus

Using the present experiment, we determine the economic value of labels signalling fair trade practices or a GI. The exit questionnaire successively ask participants to choose a premium δ for pickles with a fair trade label or with a GI with a range of values varying from EUR 0 to EUR 0.60 with a 10-cent interval between possible choices. The exit questionnaire states that the fair trade label certifies that the rights of workers who grow and pick pickles in developing countries are respected and that workers receive a decent wage. The geographic indication is defined as a label certifying that the pickles are grown and packaged in France. The range of values stops at EUR 0.6, as it already represents 17.6 per cent of the average observed price for a Maille pickle jar in French supermarkets.

Figure 3 reports the results linked to these questions. First, we can note that 23.9 per cent of participants do not want pickles with a GI or are not likely to pay a price premium for them. This share equals 25 per cent for pickles with a fair trade label. Second, the premium that participants are ready to pay for pickles with a GI is relatively close to the one they are ready to pay for fair trade pickles. This indicates that there is no clear priority for consumers between the domestic location of production and the fair conditions of production abroad.

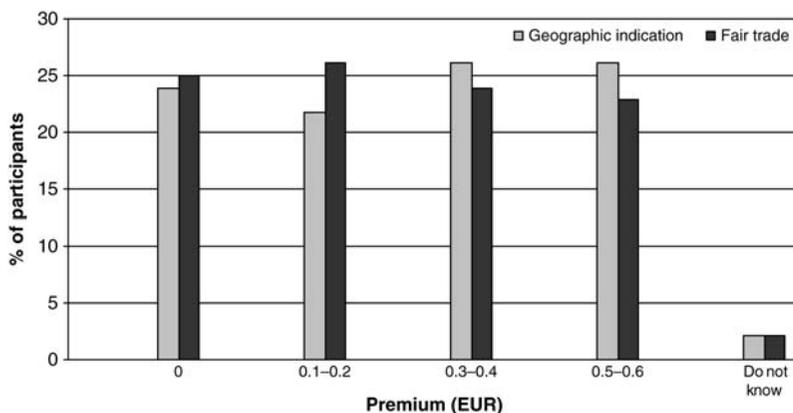


Fig. 3. Price premium for pickles with a GI or a fair trade label (EUR).

By combining these price premiums with WTP, one can determine the consumers' surplus and the related value linked to the introduction of new fair trade/geographical labels. We define two scenarios: a baseline scenario where only conventional pickles are available on the market and a scenario where both conventional and labelled (fair trade or GI) pickles coexist. The participant surplus variation is computed by comparing the surplus in both scenarios. Each participant's choice is inferred because real choices are not observed—only bids in the laboratory. In addition, we make the following assumptions: first, in the baseline scenario, we assume that conventional pickles are only grown in developing countries. Note that this is almost the case in France in 2010, where pickles from abroad have completely replaced pickles from France. Furthermore, in this baseline scenario, participants may or may not be aware of the foreign origin of the conventional product. As such, we consider two extremes: a situation where participants are fully informed of the origin (because of either a possible regulation making the origin mandatory or intense media coverage) and a situation where participants are completely uninformed of the origin.¹⁰ Second, conventional pickles are sold at price P_0 , while P_1 is the price of labelled products with $P_1 > P_0$. Third, for the sake of simplicity, both groups of participants are merged, and we assume that a participant purchases the product if his or her WTP for that product is equal to or higher than the average market price.

Obviously, more-complex scenarios could be considered, but the present framework serves to illustrate the key factors at play when comparing welfare estimates. We also refrain from speculating on the factors that cause participants to be uninformed/informed, such as media coverage or sociological sensitivity.

We first focus on the baseline scenario with only conventional pickles on the market and consider the situation where participants are uninformed about the origin of such pickles. This corresponds to the round of the experiment preceding the revelation of origin – that is, to the first round leading to WTP1. The participant i can choose between two outcomes (conventional pickles and none) and has a direct benefit equal to $\max\{WTP1_i - P_0, 0\}$. This value of WTP1 may be different from the one under perfect information given by WTP5. As participants are ignorant about the pickles' origin and all the information linked to the multinational firm, the non-internalised premium is defined by $I_i(WTP1_i - WTP5_i)$, where I_i is an indicator variable taking the value of 1 if participant i is predicted to have chosen the conventional pickles at P_0 with $WTP1 > P_0$ in choice 1 (and 0 otherwise). The consumer surplus for the uninformed individual i purchasing conventional

10 In reality, adoption may not be 100 per cent, and one could model an intermediate situation by introducing a parameter that describes the extent of adoption and/or consumer perception about the origin of the product. Here, for the sake of simplicity, we focus on the extremes: fully informed or uninformed consumers. In our sample, only 5 per cent of participants knew the foreign origin of pickles sold by Maille.

pickles is given by:

$$CS_{A,U}^i = \max\{WTP1_i - P_0, 0\} - I_i(WTP1_i - WTP5_i). \quad (1)$$

We define $N_{A,U}^C$ as the number of participants who purchase the conventional pickles with $WTP1_i - P_0 \geq 0$.

Now consider a situation where participants are fully informed of the origin of the conventional pickles. This situation corresponds to the situation after the last round of bids eliciting WTP5. The participant i can again choose between two outcomes: conventional pickles and none. She/he chooses the alternative that generates the highest utility, and thus, the corresponding consumer surplus is:

$$CS_{A,I}^i = \max\{WTP5_i - P_0, 0\}, \quad (2)$$

where $WTP5_i$ denotes the bid linked to the conventional pickles during elicitation round 5 for a participant i with $i = 1, \dots, N$, where N is the number of participants. We define $N_{A,I}^C$ as the number of participants who purchase the conventional pickles with $WTP5_i - P_0 \geq 0$.

When labelled pickles (GI or fair trade label) are introduced at price P_1 , there is a new alternative for participants with a WTP equal to $WTP5_i + \delta_i$. We assume that with the label, participants become fully aware of the origin of the conventional products.¹¹ In this case, participant i (with $i = 1, \dots, N$) chooses the alternative that generates the highest utility, and thus, the surplus is:

$$CS_B^i = \max\{WTP5_i - P_0, WTP5_i + \delta_i - P_1, 0\}. \quad (3)$$

We define N_B^C as the number of participants who purchase the conventional pickles with $WTP5_i - P_0 \geq WTP5_i + \delta_i - P_1 \geq 0$, and N_B^L as the number of participants who purchase the labelled pickles with $WTP5_i + \delta_i - P_1 \geq WTP5_i - P_0 \geq 0$.

The variation in surplus following the introduction of the labelled product is defined by $CS_B^i - CS_{A,Z}^i$, with $Z = I, U$. The average surplus variation across the overall number N of participants is defined by:

$$\Delta CS_{Label}^N = \frac{\sum_{i=1}^N [CS_B^i - CS_{A,Z}^i]}{N}. \quad (4)$$

A positive variation $\Delta CS_{Label}^N > 0$ means that participants benefit from the label because some of them purchase the labelled product.

11 An alternative assumption would consist in considering that consumers are not aware of the origin of conventional products, for which the WTP would be $WTP1_i$ or $WTP3_i$.

4.2. Application

Lastly, using the WTP and price premiums expressed by participants during the experiment, we estimate surpluses. We use the following market prices: $P_0 = \text{EUR } 3.40$ for a jar of conventional pickles (which corresponds to the average observed retail price in French supermarkets) and $P_1 = \text{EUR } 3.63$ for a jar of labelled pickles. For the sake of simplicity, we assume the same price for the GI and the fair trade label. The price $P_1 = (1 + 0.2 \times 0.35) P_0$ is determined by (i) knowing that the cost of foreign conventional pickle production is 35 per cent lower than the cost of labelled pickle production and (ii) assuming that the cost of pickles represents 20 per cent of the overall price of the jar. Table 3 reports the variation in the number of participants purchasing each type of pickles and the surplus variation following the introduction of labelled pickles on the market.

Table 3 suggests that the introduction of labelled products significantly increases consumers' surplus. The number of participants purchasing the conventional pickles significantly decreases after the introduction of the labelled pickles, as many of them switched to the labelled pickles, thereby leading to the highest surplus defined by $\text{WTP}_i + \delta_i - P_1$. The average surplus increases because participants initially purchasing conventional pickles are the ones that place a relatively high premium on the labelled products. With the GI label, the average value of δ given by the exit questionnaire is 0.36 for all participants purchasing conventional pickles (based on WTP_5), versus only 0.24 for participants not purchasing conventional pickles. This difference is statistically significant at 2 per cent with a comparison across the sample based on a Mann–Whitney U test (Z -value = -2.349 , p -value = 0.019). Similar results are obtained for the fair trade label.

Participants who did not purchase conventional pickles place a low premium on the label, and they do not buy the labelled pickles. Therefore, the increase in the number of participants purchasing labelled pickles is completely offset by the decrease in the number of participants purchasing the conventional pickles. This number decreases with uninformed participants (left column), as pickles with labels are more expensive. There is a 'stigma' (namely, a negative impact) of new labels on the market share of conventional products because the new product with labels only attracts previous consumers of conventional pickles. Analysing the WTP for conventional milk, Kanter, Messer and Kaiser (2009) observe a significant decrease of this average WTP after the introduction of new labels. Our results differ because we go beyond the WTP analysis for measuring the impact of new labels on market share depending on consumers' surplus. Eventually, the situation where participants are initially unaware of the origin of pickles (left column) shows a larger surplus variation than the situation where they are aware (right column), as the non-internalised premium $I_i(\text{WTP}_1 - \text{WTP}_5)$ of equation (1) is eliminated with the label.

This application is simple and based on various assumptions. In real situations, participants are limited in their ability to collect complete information

Table 3. Participants' surplus variation linked to the introduction of labels

	GI		Fair trade	
	Uninformed participants	Informed participants	Uninformed participants	Informed participants
Average premium $E(\delta)$ (EUR)	0.267	0.267	0.239	0.239
Variation in the number of participants ^a				
With conventional pickles	-17	-16	-15	-14
With labelled pickles	+16	+16	+14	+14
Average surplus variation (EUR per jar) ^b	0.090 (+66.6%)	0.045 (+25.8%)	0.082 (+60.3%)	0.036 (+20.9%)
Annual aggregate surplus variation (thousand EUR) ^c	5,921	2,931	5,368	2,377

^aDefined by $N_B^C - N_{A,U}^C$ for the conventional pickles with uninformed consumers, by $N_B^C - N_{A,I}^C$ for the conventional pickles with informed consumers and by N_B^L for the labelled pickles.

^bDefined by equation (4). For the average surplus variation, the relative variation in percentage terms is given in parentheses.

^cThe annual aggregate surplus is defined by $M \times$ (average surplus variation), where M is the number of 'equivalent' jars of pickles purchased over a year in France. According to INRA (2010), the French annual consumption of pickles equals 25,000 tons (net drained). The jar used for the experiment contains 380 g of pickles (net drained). M is therefore equal to 25,000,000,000/380.

about products, and they may be confused about different labels. Moreover, the cost of building the reputation of a new label indicating the origin and/or the fair trade needs to be taken into account. The profits for the pickle producers also need to be detailed to complete this study.

5. Conclusion

Using a laboratory experiment, we found that issues surrounding globalisation mattered to food consumption choices of participants. It seems, however, that concerns linked to the replacement of the domestic sourcing by foreign sourcing are not significant, as participants reverse their WTP when positive economic information is revealed. This result was obtained almost two years after the financial crisis, which indicates a relatively low level of support for protectionism. French consumers support globalisation, at least in supermarkets. The results are not definitive and should be replicated with other food products that represent a larger share of spending and budget than pickles. However, going beyond the 'particularity' of pickles, our experiment clearly shows that the origin of products matters, not only with respect to Maille, which is a famous brand, but also to all brands.

The experiment also studies the effect of two different labels regarding where the product is from and whether fair trade practices are being used. The introduction of labelled products on the market increases the average consumer surplus, as the participants initially purchasing the conventional food products are the ones who place a relatively high premium on these labels. These labels could, therefore, coexist with conventional products. This means that farmers can defend the origin of their products via a labelling policy compatible with WTO requirements rather than alternative protectionist policies.

The results of this experiment also have implications for firms. The significant decrease in consumer WTP due to negative messages about foreign sourcing/closure of processing facilities is reversed after the revelation of positive information linked to new products/services and new investments recently made by the firm in the domestic country. This suggests that firms should couple difficult decisions about the streamlining of the supply chain with decisions that are more favourable to the domestic country in order to retain their market share.

Acknowledgements

This paper benefited from financial support from CEPREMAP's international trade programme. We thank participants at IATRC 2010 and EAAE 2011 for their helpful suggestions.

References

- Becker, G. M., DeGroot, M. H. and Marschak, J. (1964). Measuring utility by a single-response sequential method. *Behavioural Science* 9: 226–232.
- Bohm, P., Linden, J. and Sonnergard, J. (1997). Eliciting reservation prices: Becker-DeGroot-Marschack mechanisms vs. markets. *Economic Journal* 107: 1079–1089.
- Delorme, G. and Selles, V. (2006). Le cornichon local ne se rend pas. *L'Yonne Républicaine*, August 18.
- Drichoutis, A. C., Lazaridis, P. and Nayga, R. M., Jr (2008). The role of reference prices in experimental auctions. *Economics Letters* 99: 446–448.
- European Council (2006). Council Regulation (EC) No. 510/2006 of 20 March 2006 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs. *Official Journal of the European Union*. Brussels, Belgium: European Commission.
- European Commission (2008). *Eurobarometer 69 – The Europeans and Globalization*. Brussels, Belgium: European Commission.
- European Commission (2010). *Special Eurobarometer 357 – International Trade*. Brussels, Belgium: European Commission.
- Fox, J., Hayes, D. J. and Shogren, J. F. (2002). Consumer preferences for food irradiation: how favorable and unfavorable descriptions affect preferences for irradiated pork in experimental auctions. *Journal of Risk and Uncertainty* 24: 75–95.

- Harrison, G. W., Harstad, R. M. and Rutström, E. E. (2004). Experimental methods and elicitation of values. *Experimental Economics* 7: 123–140.
- Hassan, D. and Monier-Dilhan, S. (2006). National brands and store brands: competition through public quality labels. *Agribusiness* 22: 21–30.
- Hayes, D. J., Shogren, J. F., Shin, S. Y. and Kliebenstein, J. B. (1995). Valuing food safety in experimental auction markets. *American Journal of Agricultural Economics* 77: 40–53.
- INRA (2010). La préparation des cornichons au vinaigre, les connaissances. http://www.inra.fr/la_sciences_et_vous/apprendre_experimenter/attention_microorganismes/les_cornichons/la_preparation_des_cornichons_au_vinaigre_les_connaissances. Accessed 27 October 2011.
- Kanter, C., Messer, K. and Kaiser, H. M. (2009). Does production labeling stigmatize conventional milk? *American Journal of Agricultural Economics* 91: 1097–1109.
- Loureiro, M. L. and McCluskey, J. J. (2000). Assessing consumer response to protected geographical identification labeling. *Agribusiness* 16: 309–320.
- Lusk, J. L. and Fox, J. A. (2003). Value elicitation in retail and laboratory environments. *Economics Letters* 79: 27–34.
- Lusk, J. L. and Shogren, J. F. (2007). *Experimental Auctions. Methods and Applications in Economic and Marketing Research*. Cambridge, UK: Cambridge University Press.
- Marette, S., Roosen, J., Blanchemanche, S. and Verger, P. (2008). The choice of fish species: an experiment measuring the impact of risk and benefit information. *Journal of Agricultural and Resource Economics* 33: 1–18.
- Scarpa, R., Philippidis, G. and Spalatro, F. (2005). Product-country images and preferences heterogeneity for Mediterranean food products: a discrete choice framework. *Agribusiness* 21: 329–349.
- Tegene, A., Huffman, W. E., Rousu, M. and Shogren, J. F. (2003). The effects of information on consumer demand for biotech foods: evidence from experimental auctions. Economic Research Service, Research Briefs, Technical Bulletin Number 1903, United States Department of Agriculture (USDA). Washington, DC: USDA.
- Thornhill, J. (2008). Review of ‘Après la démocratie’. *Financial Times*, November 30.
- Todd, E. (2008). *Après la démocratie*. Paris, France: Gallimard.
- Toler, S., Briggeman, B. C., Lusk, J. L. and Adams, D. C. (2009). Fairness, farmers markets, and local production. *American Journal of Agricultural Economics* 91: 1272–1278.
- van Bergeijk, P. (2010). *On the Brink of Deglobalization*. Cheltenham, UK: Edward Elgar.
- WTO (2005). Panel reports out on geographical indications disputes. Geneva, Switzerland: World Trade Organization.
- WTO (2006). *Dispute Settlement: DISPUTE DS174. European Communities – Protection of Trademarks and Geographical Indications for Agricultural Products and Foodstuffs*. Geneva, Switzerland: World Trade Organization.

Appendix A: Information revealed

The precise messages are translated from the original French.

General information before WTP1 for both groups:

You can buy the Maille brand pickle jar that is in front of you. For your information, the retail price of this jar is about EUR3.40.

Information about foreign sourcing of pickles before WTP2 for group I and before WTP4 for group II:

In 2000, the Anglo-Dutch group Unilever bought the brand Amora-Maille. In 2004, Unilever, the owner of Amora-Maille, decided, for cost reasons, to source its pickles from India and Madagascar. French producers suddenly had no outlets and had to restructure.

Information about closure of processing facilities in France before WTP3 for group I and before WTP5 for group II:

In November 2008, Unilever announced a reorganisation of its activities:

- Closure of two production plants of Amora-Maille in Burgundy (265 jobs lost);
- Outsourcing of the logistic activities of Amora-Maille;
- Concentration of marketing activities at the headquarters of Unilever France in Rueil-Malmaison (suburbs of Paris) and concentration of research and development activities for the European market in the Netherlands.

According to the management of Amora-Maille, these reorganisations were made for reasons of economic rationalisation.

Information about new products and services before WTP4 for group I and before WTP2 for group II:

Over the last few years, the Maille brand, owned by the Anglo-Dutch group Unilever, was reinforced and renewed with the development of new products and the launch of an online boutique in 2007.

In a highly competitive environment, Maille succeeded in strengthening its image of a traditional and high-quality product.

Information about new investments made in France before WTP5 for group I and before WTP3 for group II:

Over the last few years, the sales of condiments have decreased sharply in France (e.g. – 12 percent for pickles since 2003).

Despite this fall, Unilever France plans to invest EUR10 million over the next few years in Burgundy.

The group also plans to locate its new French logistic centre for its food activities in Burgundy. This location should induce the creation of 250–300 jobs, of which 150 will be saved for the former Amora-Maille employees who lost their jobs following the closure of two of the group's production plants in 2008.